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DETAILED ACTION

1. This Office action is in response to the amendment filed May 31, 2011.
2. Claims 23, 26-30, and 33-40 are pending and have been examined.
3. Claims 23, 30, 33-36, 38, and 39 have been amended.

Continued Examination Under 37 CFR 1.114

4. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 05/31/2011 has been entered.

Response to Amendment

Claim Objections

5. Claims 23, 26-29, 37 and 40 are objected to because of the following informalities:
 - Claim 23, lines 14 and 15 show an amendment from the claims as they did not appear before the current amendment. Specifically the claim shows deleting the phrase “using the second thread” when it should show deleting the phrase “using the second thread to generate” according to the previous amendment. The words “to generate” do not appear in the current claim set when they did appear in the previous claim set. Appropriate correction is required.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 23, 26-30, and 33-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tyler (US 6,131,183) in view of Carlson et al. (US 6,842,898), hereinafter Carlson.

Regarding claim 23, Tyler teaches the invention substantially including a method for communicating between threads [col. 5, lines 50 – 60], comprising:

invoking a first thread [ARC/INFO controller 44; col. 4, lines 3 – 13];

associating a first input stream and a first output stream with the first thread [system 42 is provided with two TTY data streams; a standard input "stdin" and a standard output "stdout", Fig. 6; col. 4, lines 47 – 55];

invoking a second thread [ARC/INFO program 28 as a child process; col. 4, line 65 – col. 5, line 4];

associating a second input stream and a second output [glues its stdin and stdout to "childWrite" and "childRead" respectively; col. 4, line 65- col. 5, line 4]; and

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connecting the first output stream to the second input stream [glues its stdin and stdout to "childWrite" and "childRead" respectively; col. 4, line 65- col. 5, line 4];

invoking a stream operator to write a first data value from the first thread to the second thread [controller 44 simply passes its stdin through its childWrite to the stdin of the ARC/INFO program 28; col. 5, lines 3 – 11], wherein the stream operator sends the first data value from the first output stream to the second input stream [user program through childWrite to the stdin of the ARC/INFO program 28; col. 6, lines 10 – 20];

generating, by the second thread, a second data value by performing an operation on the first data value [Figures 3 and 6; Column 4: 34-36; Column 4: 53-60. A TTY command is sent from the terminal emulator to the stdin of the Arc/Info Controller and redirected to the Arc/Info Program child through the use of pipes. The program then performs operations as any normal program would and the output or results from the program is sent back through the ARC/Info Controller and back to the terminal emulator.]; and

invoking the stream operator to write the second data value from the second thread to the first thread [takes the stdout of the ARC/INFO program 28 through its childRead and passes it along to its stdout; col. 5, lines 3 – 11], wherein the stream operator connects the second output stream to the first input stream and sends the second data value from the second output stream to the first input stream [glues its stdout to "childRead"; col. 4, line 65 – col. 5, line 3];

wherein at least one selected from the group consisting of the first thread and the second thread manages an operating system process [With the Unix operating system it is simple to redirect stdin and stdout to the terminal emulator 26 or to a file or user program; col. 4, lines 47 –

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55]. Although Tyler teaches the invention substantially, Tyler does not specifically teach the threads comprise a program counter, a stack, a state, and a register set.

However, Carlson teaches communication between threads [col. 4, line 63 - col. 5, line 5] using a hardware processor [Fig. 2] and the threads comprising a program counter [a thread typically includes a program counter; col. 4, lines 42 – 64], a stack [stack; col. 4, lines 42 – 64], a state [thread can have one of several states; col. 4, lines 42 – 64], and a register set [register set; col. 4, lines 42 – 64].

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the invention of Tyler to incorporate the features of Carlson because this provides a method and apparatus for handling call backs on system events for a collection of related threads [col. 4, lines 42 - 64 of Carlson].

Regarding claim 26, Tyler teaches the second thread is a child thread of the first thread [col. 4, line 65 – col. 5, line 4].

Regarding claim 27, Tyler teaches at least one selected from the group consisting of the first input stream, the first output stream [col. 4, lines 47 – 55], the second input stream, and the second output stream is a standard stream [col. 4, line 65- col. 5, line 4].

Regarding claim 28, Tyler teaches the standard stream is directly built into a dynamically typed programming language [col. 2, lines 12 – 18].

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Regarding claim 29, Tyler as modified teaches associating a first error stream with the first thread [col. 5, lines 13 – 49 of Carlson].

Regarding claim 37, Tyler teaches the first thread and the second thread are associated with a single process [col. 4, line 65 – col. 5, line 4].

Regarding claim 40, Tyler teaches wherein the stream operator is a symbol [col. 4, lines 47 – 55].

Regarding claims 30, 33-36, 38, and 39, these are product claims that correspond to method claims 23, 26, 29, 37, and 40; see the rejections to claims 23, 26-29, 37, and 40 above, which also meet these product claims.

Response to Arguments

8. Rejection of claims under §103(a):

Applicant's arguments with respect to the claims have been fully considered but are not persuasive.

Applicant asserts Tyler does not teach writing a first data value from the first thread to the second thread using the input/output streams. Applicant further states that Tyler's registration process takes places before the input/output streams are connected so the registration process does not use these input/output streams.

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Applicant's arguments are related to the limitations dealing with writing a first data value from the first thread to the second thread and the second thread using the first data value to generate a second value and writing the second data value to the first thread. The cited sections of Tyler above are believed to teach these steps. Specifically it is noted that the processes of "gluing" the "childWrite" and "childRead" of the first thread (Arc/Info Controller) to the stdin and stdout of the second thread (Arc/Info program) is done prior to the sending of the data through the pipes between the user program (in the specific case a terminal emulator) and the Arc/Info program. Tyler provides a specific example where a TTY command is sent from the terminal emulator through the Arc/Info Controller to the Arc/Info Program. The program performs its normal operation and the output is sent from the Arc/Info Program through the Arc/Info Controller back to the terminal emulator (Column 4: 56-60, "The system 42 is most easily verified when stdin and stdout are connected to a terminal or a terminal emulator. Typing in ARC/INFO commands at the terminal and verifying the results on the terminal and ARC/INFO display is done in the same manner as using ARC/INFO directly."). The first data value in this scenario is the TTY command sent from the Arc/Info Controller (first thread) to the Arc/Info Program (second thread). And the second data value would be the results sent from the Arc/Info Program (second thread) to the Arc/Info Controller (first thread). The results are generated from the program execution so an operation by the second thread would inherently be performed.

Therefore Tyler does teach writing a first data value from the first thread to the second thread using the input/output streams as well as the second thread using the first data value to

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generate a second value and writing the second data value to the first thread through the input/output streams.

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Conclusion

9. Any inquiry of a general nature or relating to the status of this application or concerning this communication or earlier communications from the examiner should be directed to Kimberly Jordan whose telephone number is 571-270-5481. The examiner can normally be reached on Monday-Friday 9:30am-5pm EST. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hyung Sough can be reached on 571-272-6799.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kimberly Jordan/
Examiner, Art Unit 2194

/H. S. Sough/
Supervisory Patent Examiner, Art Unit 2194